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ORIGINAL ARTICLES.

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FIVE CASES OF PARINAUD'S CONJUNCTIVITIS.<sup>1</sup>

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IN FEBRUARY, 1889, Parinaud reported to the Ophthalmological Society in Paris, three cases of an affection which he called infectious conjunctivitis of animal origin. Since then, six other cases have been reported in France,<sup>2</sup> while in Austria, Goldzieher<sup>3</sup> has described the same affection, evidently without knowledge of Parinaud's communication, as lymphoma of the conjunctiva. Aside from this, if we except a questionable case described by Greeff,<sup>4</sup> in Berlin, as pseudo-trachoma, the disease has not, so far as I know, been reported elsewhere. The main characteristics of this conjunctivitis, as described by the French, are a rather sudden onset with great

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<sup>1</sup>Read before the Third Annual Meeting of the Western Ophthalmological and Oto-Laryngological Association, held at Chicago, Ill., April 7-8, 1898.

<sup>2</sup>The original communication of Parinaud is hard to get; I know it mainly from Despagne's article (*Revue d'Ophtalmologie*, November, 1896, p. 665) and from the thesis of Dominique (*Thèse de Paris*, 1897) in which all the other French cases referred to in this paper are collected.

<sup>3</sup>*Centralblatt f. Augenheilk.*, 1893, p. 112.

<sup>4</sup>*Archiv. f. Augenheilk.*, xxiv, p. 60.

thickening of the lids; muco-purulent discharge, sometimes profuse at first but rapidly becoming rather scanty; the formation within a week or two of large frequently polypoid and pedunculated granulations, on the tarsi, on the folds, or on both, and sometimes on the ocular conjunctiva. Between these larger granulations which are at first red or greyish-red and somewhat translucent there sometimes occur numerous smaller yellowish ones. Between or on the large granulations there sometimes occur erosions or small ulcerations. Almost immediately after, or very rarely before, the development of the conjunctivitis, there occurs sudden inflammation of one or more of the groups of lymph-glands on the same side; the preauriculæ and retro-maxillary groups being most frequently involved, though sometimes both these and the cervical and sub-maxillary glands are affected. This affection of the lymphatics is generally very marked, the swelling being sometimes enormous and suppuration occurring frequently. With the onset of the disease, slight rigors and fever with general depression sometimes occur. If we except the single atypical and somewhat doubtful case of Rohrer, the affection is always one-sided, showing no tendency to spread to the second eye, nor to any other individuals with whom the infected person may come in contact. Left to itself it generally undergoes a spontaneous cure in from two to six months, though it is sometimes very obstinate about responding to various forms of treatment. Parinaud considered the infection to be of animal origin partly on account of its isolated and unusual character; and partly because one of his patients was the wife of a butcher, while another lived in a house in another part of which meat was stored; and most other French authors who have reported cases have fallen in with this idea upon similarly scanty premises.

My own cases are as follows:

CASE I.—F. C., aged 43 years, an American commercial traveler, came to me October 21, 1890, saying that about three weeks before, while riding on a freight train, he got dust or a cinder into the right eye, and within two or three days the lids of the eye began to swell and the eye to discharge. Soon after, the glands of the neck became swollen. Stat. præ.: R. E., upper lid œdematous and drooping, showing only one-half the cornea. Conjunctival surface, both of the tarsi and retro-tarsal folds covered with large rounded granules with several patches

of superficial ulceration. Cornea clear, discharge only moderate, irritation and discomfort insignificant; pre-auricular and retro-maxillary glands on the right side are merged in a large swelling which makes that side of the face look as if the patient had a pronounced case of mumps; the eyes and lymphatics of the left side entirely normal. Though this case presented some resemblance to the most marked cases of acute trachoma, the size of the granulations, some of which, especially on the folds, were almost pedunculated; the occurrence of the areas of ulceration between them, the marked involvement of the lymphatics, combined with the rather scanty discharge and the remarkable freedom from subjective symptoms made me sure that it was a different disease. The treatment consisted in frequent irrigations of boracic acid solution, hot applications and, later, sulphate of copper and 2 per cent. nitrate of silver applied to the everted lids. The changes which occurred under the use of these caustics were far more gradual than is usual with acute trachoma and at the end of the three weeks during which the man was under my care the granulations were about as prominent as ever, but the discharge and the swelling of the lids had decreased perceptibly. I do not know what treatment was pursued after he left Omaha, but he gradually got entirely well in the course of the next few months; the swelling of the lymphatics also disappeared without the occurrence of suppuration. When I saw him again in 1897 the conjunctiva was entirely smooth but had a slight atrophic look similar to that left in some cases of trachoma, and the upper lid drooped slightly.

CASE 2.—Mabel H., aged 7 years, a healthy American girl, began to have some trouble with L. E. six months ago, but for the last two weeks has been much worse. Stat. præ.: R. E. normal, except for moderate congestion of conjunctival folds; L. E., retro-tarsal folds above and below thickly studded with polypoid granulations averaging one-eighth of an inch in diameter; most of them somewhat pedunculated. The surface of the granules is rough and covered with a tenacious but rather scanty discharge; aside from this, no ulcerations of the conjunctiva; one large granulation on the lower tarsus, otherwise tarsal conjunctiva normal; cornea normal; deeply seated in the upper tarsus is a swelling the size of a small pea which, on being incised, emits a thin yellowish pus. The glands of the

parotid region and along the posterior border of the sternomastoid muscle markedly swollen on the left side; on the right side there is a very slight swelling of the cervical glands only. Under chloroform the granulations were trimmed off and after a week or ten days the child went home practically well. The glands did not suppurate.

CASE 3.—October 12, 1896. M. L., aged 38 years, an American farmer, says that about two weeks ago, left upper lid began to feel sore, and within twenty-four hours thereafter the glands of the face and neck were swollen and the eye was discharging freely. The discharge increased for some days and then decreased. Stat. præ.: R. E. normal; L. E. conjunctiva of the ball, of the lower tarsus and fold, and of nearly all the upper tarsus normal; upper retro-tarsal fold much swollen and coarsely rough with three large fungiform granulations, one just outside the center, one-eighth of an inch in diameter; another at the junction of the tarsus and the fold near the inner angle; and a third, about one-half as large, on the tarsus close to the inner angle. In the center of the fold is an elevated ulcerated area about one-fourth of an inch in diameter with much thickened borders of granulation tissue. The surface of the ulcer is uneven and grey, the grey substance not being easily removed by the sharp spoon; cornea clear and sight normal; secretion very moderate; subjective symptoms almost wanting; pre-auricular and retro-maxillary glands, on the left side only, much swollen and tender; but the patient assures me they are not nearly so large nor so tender as a week ago. The granulations and edges of the ulcer were trimmed off and the ulcer cauterized with solid nitrate of silver. He went home the same day with a boracic acid collyrium and directions to have 2 per cent. nitrate of silver applied daily. When seen again, October 22, the eye appeared nearly well, the ulcer was gone, and there was very little swelling. The swelling of the glands subsided without suppuration.

CASE 4.—August 29, 1893. Romeo L., aged 9 years, of Scandinavian parents; about a week ago R. E. got sore. Stat. præ.: R. E. normal; L. E. both retro-tarsal folds and much of the upper half of the bulbar-conjunctiva studded with numerous little pustular-looking nodules. Many of these appear to have broken down leaving shallow ulcers 2 to 5 mm. across. Toward the outer angle in the lower cul-de-sac several large



fungiform granulations. Some of these look yellowish in the center but emit no fluid upon opening; discharge and irritation very slight; cornea clear; no decided swelling of pre-auricular glands, but a row of glands behinds the sterno-mastoid muscle, on the left side only, very decidedly enlarged. Boracic acid and calomel were tried for several days without much effect. Then yellow ointment was tried, but the child disappeared before any great change had occurred.

CASE 5.—November 2, 1887. John K., aged 25 years, Bohemian, machinist. Two weeks ago R. E. began to discharge and lids became swollen. Kept getting worse for three days, at the end of which time the swelling was extreme. Then the symptoms declined to some extent. Soon after the eye trouble began, the glands of the face and neck swelled. Stat. præ.: L. E. normal; R. E. moderate muco-purulent discharge; both retro-tarsal folds swollen, granular and studded with small superficial ulcers covered with greyish secretion; two of these ulcers are on the upper tarsus and a few on the bulbar conjunctiva, one of them about one-eighth of an inch in diameter only one-eighth of an inch above the cornea; cornea normal; irritation slight; pre-auricular glands and those behind and below the jaw, on the right side only, immensely swollen and somewhat tender, but not so much now, according to the patient's statement, as some days ago. A collyrium of sublimate 1-5000 and hot applications were ordered and the patient went home to a neighboring town. He was not seen again, but I heard indirectly that his eye got entirely well in the course of a few weeks. I am not sure whether the glands suppurated or not, but I think not.

The last two cases are somewhat atypical, Case 5 on account of the absence of the large characteristic granulations and the number and extent of the conjunctival ulcers; Case 4 in the comparatively slight involvement of the lymph glands; but I feel sure that they belong in the same category with the others and I consider them of decided importance as giving the clew to what I believe to be the true nature of the disease. It seems to me probable, that the infection starts with the formation of a greater or less number of small abscesses in or below the conjunctiva. In this stage the patient is seldom or perhaps has never yet been seen. When these abscesses break, the discharge becomes profuse for a short time, and in most

cases large granulations develop from the edges of some of the ulcerations or the small fistules left by the abscesses. But where, as in Case 5, these granulations fail to develop to any great extent the ulcerations may remain as the most prominent features. It may be that in the cases like Case 1, where the whole tarsal surfaces are covered with granulations, some of these have a different origin, but that this is the explanation of the occurrence of the large fungiform and polypoid forms, I firmly believe. Despagne has also pointed out that the small yellowish granulations, observed in his case, were really abscesses, but it does not seem to have occurred to any one that the larger granulations may have had a similar origin. From a clinical standpoint, all the cases hitherto reported may roughly be divided into two classes, those like Case 1, in which the whole tarsi are studded with granules and which have a certain resemblance to very pronounced cases of acute trachoma; and the more numerous ones in which the polypoid character of the granulations is more pronounced, the folds being chiefly involved, the tarsal surfaces remaining comparatively or quite normal, any granulations which occur upon them being surrounded by perfectly normal membrane. Where, in one of the cases, such an ulcer as that in Case 3 occurs, the question of tubercular conjunctivitis might easily be raised. I have never seen but one case of the latter affection and I must say that the ulcers and the granulations both presented a decided resemblance to those of Mr. L. The main points of difference were in the history, in the much more decided redness of the otherwise normal conjunctiva, in the tuberculous case; and in the comparatively slight involvement of the lymphatics; the swelling of which in the tuberculous cases never attains to anything like the size generally observed in the disease considered in this paper.

With regard to the question of the animal origin of the disease, it may be that Parinaud's view is correct, but his grounds for this seem to me entirely insufficient. Of the nine cases hitherto reported in France, only one occurred in the family of a butcher, two lived in the same building with butcher shops (one of these had been amusing himself by burying dead birds), one lived in the same building with a leather dresser, one lived on the same street with a butcher shop, two lived upon farms and more or less to do with the care of animals,

while in the other two there was no question of connection with butcher shops or domestic animals. This is the sum of the evidence in favor of the animal origin of the disease. Goldzieher says nothing of a supposed animal origin. Of my own patients I have no notes on this point with regard to the children, but in none of the others was there any evidence in favor of an animal origin. One of the men was a farmer but had abundant help and never took care of his own stock. The disease is evidently infectious; apparently non-contagious; and its rarity, as Parinaud urges, speaks in favor of an unusual origin. Bacteriological investigations as to its origin have not been fruitful; a very careful investigation of one case by Morax gave no clue to the nature of the germ which probably caused it. In two cases, those of Kalt and Rohmer, streptococci were found either in the pus from the eye or from the inflamed glands, or both, but these were probably merely indications of secondary infection. My own observations in this line are very incomplete. In the three cases from which I have made cultures nothing of more than secondary importance was found. A microscopic examination of one of the large granulations in Case 3 showed the ordinary structure of a granulation tumor with rather more fibrous tissue than usual, and a number of giant cells, some of the latter containing vacuoles.

With regard to the therapeutics of the affection, all sorts of remedies, including the powers of Nature, have produced good results in the end, although in the cases where the whole upper tarsus was affected the progress has been slow. Parinaud recommends the use of nitrate of silver. Abadie has seen good results from the galvano-cautery; others recommend iodoform ointment. In my one bad case the sulphate of copper crystal seemed to do some good. In the cases where there are comparatively few but large granulations, undoubtedly the best treatment is to clip them off and cauterize any ulcerations that may exist.

With regard to the prognosis, while in the worst cases the prognosis is slow, no affection of the cornea nor other serious result has occurred in any case except that of Rohmer<sup>5</sup>; and this case was so exceptional in several ways that it is doubtful whether it really belongs in this class.

In designating this disease, I think it is best to waive the question of an animal origin and simply call it Parinaud's con-

junctivitis, because he was undoubtedly the first to recognize and describe the main complex of symptoms. From an historical standpoint, however, it is of interest to note that a case described by Goldzieher in 1882<sup>6</sup> as lymphadenitis conjunctivæ was, in my opinion, the first case of this disease to be reported although Goldzieher himself does not seem to class it with his subsequent cases.

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<sup>5</sup>Another possible exception may be tedious suppuration of the lymphatic glands. In the discussion of Despagnet's case (*Loc. cit.*, p. 670), Abadie mentions a case which he for, to me, unsatisfactory reasons, thinks should be put into a separate class, in which the preauricular and cervical glands suppurred and kept suppurating for several months; the end apparently not being reached at the time of the communication. He suggests that this may have been a case of actinomycosis.

<sup>6</sup>*Centralblatt f. Augenheilk.*, 1882, p. 321.

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### THE DE ZENG REFRACTOMETER.<sup>1</sup>

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DE ZENG'S refractometer is constructed on the principle of the Galilean telescope, having a strong concave lens of 20 D. in each eye-piece, and a weak convex lens of about 10 D. sliding within the main tube, and by varying the distance between the two lenses, we are able to produce an effect similar to that produced by a concave or convex lens, as the case may be. The nearer the two lenses are to each other, the more divergent will be the rays of light, and on gradually separating them, a point is reached at which perfect neutralization of the lenses takes place. The further separation of the lenses will render the rays convergent.

In addition, this instrument has at its front end a revolving head containing concave cylinders, whose axis can be rotated to any degree desired.

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<sup>1</sup>Read before the Third Annual Meeting of the Western Ophthalmological and Oto-Laryngological Association, held at Chicago, Ill., April 7-8, 1898.



In testing the usefulness of any instrument for which the claim is made, that it enables us to accurately determine the amount of refractive error present, it is necessary that the results obtained by it should compare favorably with those arrived at by the methods already in use.

In reaching conclusions with De Zeng's refractometer, I have compared its working with the results arrived at by skiascopy and the test-lenses, a comparison which ought to be considered fair and perfectly reliable. In every case the existing error of refraction was determined first with the refractometer, and then by skiascopy and the test-lenses, using each method independently of the other. All cases were worked out with the aid of either a one per cent. solution of atropine or homatropine and cocaine discs. In the majority of instances the latter being used. In some cases the amount of ametropia was determined first without the use of a cycloplegic, but where an active accommodation was present, the results obtained were unsatisfactory.

In about 50 per cent. of the cases I found the three methods agreed accurately, but in the balance, and particularly where an oblique astigmatism was present, it appeared impossible for the patient to decide between several axes. Skiascopy and the test-lenses determined this much quicker and more acceptably. This was also true with reference to the amount of the astigmatism—the refractometer having a tendency to an over, rather than to an under, correction. Great care should therefore be exercised in its use. Best results being obtained by the weakest cylinder. If sufficient time could be devoted to each case, positive results could undoubtedly be obtained. On the other hand, the refractometer is of great assistance in verifying the results arrived at by the other methods. In three cases, at least, it was of assistance in enabling the patient to accept an accurate axis, which, with the test-lenses, varied 15 degrees.

In simple hypermetropia, it proved satisfactory, there being very little difficulty in developing the full amount of the error. Even before a cycloplegic was used, and where an active accommodative power was present, a greater part of the latent error was determined with little difficulty.

I have, therefore come to the conclusions that :

- (1) It is not a time saver.

- (2) It is not always accurate in determining the amount and axis of the astigmatism.
- (3) It is liable to produce an over, rather than an under, correction of astigmatism.
- (4) In old people, or where a cycloplegic is contraindicated, it will prove of assistance.
- (5) In myopia and hypermetropia, it is most satisfactory in determining the full amount of the error under a cycloplegic.
- (6) It is expensive.

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### CHOROIDITIS AND CHOROIDO-RETINITIS IN YOUNG PERSONS.<sup>1</sup>

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**M**Y OWN observations in practice have not been such as to enable me to agree with the ordinary teaching of the books and didactic instructions on the subject of choroiditis. In those sources almost all cases of choroiditis that can not be unquestionably classed as rheumatic, gouty, or traumatic, are at once classed as syphilitic, and this latter is confirmed and a positive diagnosis is affirmed if any improvement or favorable modification follows the use of mercury and iodide of potassium. Now it is just this "*trump*" etiological diagnosis that I wish to inveigh against. I do not regard it as a display of good diagnostic ability to make a labored effort to draw the tail of some imaginary diathetic condition across every diagnosis one makes. I will not attempt to differentiate between the fancied yet elegant varieties of choroiditis that some have hypothesized, for if I did I should very soon become entangled in meshes from which I could not easily extricate myself; but I will utilize my own observations and describe the cases as they occur to me in a general and private practice.

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<sup>1</sup>Read before the Third Annual Meeting of the Western Ophthalmological and Oto-Laryngological Association, held at Chicago, Ill., April 7-8, 1898.

CASE I.—Miss Charlotte S., aged 18 years, no paramenia, health good, well nourished, called to know if she could have a pair of glasses to help her eyes. She said: "About two weeks ago, while doing some fancy needle work, and reading, my right eye got so I can not see as good with it." There was little pain, yet the eye was not quite comfortable. About two years ago, when in school, she had a similar trouble in the left eye. There was very little in the appearance of her eyes that would lead one to suspect any ocular trouble. The slight redness of conjunctiva of both eyes would ordinarily be regarded as a functional hyperæmia, as it was about the same as occurs in eyes of many persons when subjected to excessive use. R. E., V.=<sup>20</sup>/<sub>cc</sub>; L. E., V.=<sup>20</sup>/<sub>xx</sub>. Under mydriasis and cyclopegia refraction .50 D. hyperopia, both eyes, and the ophthalmoscope revealed an atrophic choroidal patch in the outer lower segment of the fundus of left eye, variegated black and white in ordinary figures and a margin of the appearance of *red-colored wool* around it. In the right eye—the one she was now complaining of—the vitreous body was not quite clear. The details of the fundus could not be well made out. There was deep hyperæmia of the retina, the vessels on the disc not quite so plain as outside of its edge. The margins of the disc could be defined fairly well for the condition of the vitreous body, and far toward the periphery and to the upper and temporal side could be discerned a large area of white reflex, with ill-defined borders.

She was ordered to not attempt to use her eyes for close work—sewing, or reading—to wear her correcting glasses all the time in doors, and to wear over them, when out, a pair of plain medium London smoke coquilles; to instill one drop of a four grain solution of atropia into each eye once daily to prevent accommodative and convergent effort; to take a calomel cathartic followed by a teaspoonful three times daily of Potas. Iod.,  $\mathfrak{z}\text{iv}$ ; Corros. Chlor., gr. ss; Trifolium Comp., to make  $\mathfrak{z}\text{iv}$ . At the end of twelve days she was given a teaspoonful four times daily for ten days of Tr. Digitalis,  $\mathfrak{z}\text{j}$ ; Tr. Nuc. Vom.,  $\mathfrak{z}\text{j}$ ; Tr. Ext. Ergot,  $\mathfrak{z}\text{ss}$ ; Syr. Aurant. Cort., to make  $\mathfrak{z}\text{iv}$ . After this she was ordered to take teaspoonful doses of Pyrophosphate of Iron and Calisaya Bark three times daily as long as the condition of the eyes seemed to require medication.

As the result of this treatment and continued caution and

care, I shall expect the hyperæmia of the retina to subside, the progress of the choroidal inflammation to stop, the choroid and retina to become normal in vascularity, and to become, in a sense, hardened and toughened, so as at the end of six months or a year, to endure ordinary functional activity; the atrophic spots and their coincident scotomata will, of course, remain. I advised the patient that she must not plan to occupy herself with literary pursuits or needle work.

June 30.—I have examined the case monthly since and the improvement has been as indicated in prognosis given.

CASE 2.—Miss Jessie W., a young lady aged 18 years. General good health. Slight paramenia. In school. Was referred to me by a jeweler to whom she had applied for glasses. R. E., V. $\frac{20}{xx}$ ; L. E., V. $\frac{20}{c}$ ; nor could she read anything but large type with left eye. Vision impaired for two months. No pain. Ophthalmoscope with mydriasis revealed haziness of vitreous body and a mottled area of the fundus just below the yellow spot in the left eye. The general hyperæmia of the retina and tissue around the mottled area looked like red-colored wool. Right eye normal. Refraction hyperopic 2 D. Correction ordered worn, and cycloplegia kept up by atropia, and plain coquilles worn when out of doors. I prescribed an alterative course followed by a vaso-motor tonic kept up for three months when the vitreous body had cleared up. The mottled area became more definitely defined and the surrounding choroid and retina normal, and the retina lost its *red-colored wool* appearance. She again entered school and in two years has had no return.

CASE 3.—Miss Lina G., aged 16 years. Good health. She is going to school. Within a week had noticed dull vision in left eye. The cause, course, pathological appearance, and results of the treatment were so similar to Cases 1 and 2, that I need not reiterate them.

CASE 4.—Miss Lucy M., aged 18 years; in good health. While striving in college to earn a prize in the study of Greek, she became cognizant of a dimness of vision in the right eye. She came early under observation. V. $\frac{20}{xl}$  right eye and  $\frac{20}{xx}$  left eye. Mydriasis and ophthalmoscope revealed retinal hyperæmia and just below and slightly to nasal side of yellow spot an area of red-wool appearance, and a lesser area of homogeneous red in its center. The vitreous body was not much affected. Refraction in both eyes emmetropic. I ordered



an alternative for a few days, followed by vaso-motor tonic. She was in her last year in college and could not afford to fall behind. So she was ordered to keep up use of atropia constantly to cycloplegia, and when studying to constantly wear + 2.50 D. on 4° pris. base in, pulpit eye. She continued in school, with all outside reading left off, and all night-lessons read to her by an assistant. In three months the hyperæmia of the retina was removed and the homogeneous area of redness had given place to a choroidal atrophy, the white spot with black margins being about half as large as the disc. At the end of her college course—six months—she left off treatment and wore glasses indifferently. At the end of a year after, she took the position of instructor in Greek in the college, and now after three years has had no relapse, but uses her glasses when doing extra work.

CASE 5.—Lloyd R., a boy, aged 12 years, an elegant sprightly fellow, light build, fair complexioned. Style of intellectuality and pride of doting parents. In school. An omnivorous reader. Has asthenopia and headache much of the time. There is functional hyperæmia of palpebral conjunctiva. He complained of dull vision in right eye, of a month's duration, and has had a similar trouble in left eye two years before. V., L. E.= $^{20}/_{xx}$ ; V., R. E.= $^{20}/_c$ . Refraction 2 D. Hypermetropia. Ophthalmoscope and mydriasis revealed signs of subsiding choroiditis, with dark mottled areas and surrounding red colored-wool appearances in fundus of right eye, and one covering the locality of yellow spot, central vision being lost; excepting this scotoma, the field of vision was normal. The left eye showed former choroiditis which had produced three patches of choroidal atrophy; there was no retinal hyperæmia as in the right eye. The condition of the left eye was evidently the result of the attack two years before. The tension of the globes was a little minus, probably due to loss of tone and vigor. He was prescribed an alternative for a few days, to be followed with vaso-motor tonic, alternated with an iron tonic, and mydriasis for two weeks. He was given his correcting glasses, and at the end of three weeks allowed to enter school, with some one to read the night-lessons to him, and all extra reading on his part prohibited. I examined his eyes once a month for three months, and the improvement continued, the hyperæmia leaving right eye, and the atrophic patches in the choroid becoming more defined.

I have here given a short history of five cases selected, as best illustrating choroiditis with retinal hyperæmia as I see it in private practice in young people, and without any possible syphilitic taint proximately or remotely, and as I believe originating from excessive functional activity of the eyes. It has long been recognized as a law in etiology, that an organ's liability to inflammation is increased according as its functional activity is increased. I am of the opinion that the choroiditis in this class of cases originates directly from the excessive functional activity of the eyes, predisposed to by diminished tonicity of the tissues and circulation, incident to indoor work, vitiated air, want of sunlight, and lack of general exercise; also, probably, indulgence in improper food.

The correction of errors of refraction and adjusting the eyes with lenses for the near point, relieving the necessity for convergence and accommodative effort when diseases of choroid or retina are threatened or are in active progress, I have not had brought to my attention before, but I believe it is a rational procedure in which by relieving the accommodative effort and convergence, the eye is made as passive as is possible, a condition entirely conducive to speedy relief of an inflammatory process aggravated or perpetuated by the perturbing influence of functional activity.

## SOCIETY PROCEEDINGS.

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### THIRD ANNUAL MEETING OF THE WESTERN OPHTHALMOLOGICAL, OTOLOGICAL, LARYN- GOLOGICAL AND RHINOLOGICAL ASSOCIATION.

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Discussion on paper read by DR. THOMAS A. WOODRUFF, of Chicago, entitled "*The De Zeng Refractometer*," (see page 171 of this number).

DR. FRANK ALRPORT (Chicago).—I have used the De Zeng refractometer somewhat and I regard it as a very useful adjunct. I do not regard it as accurate any more than any other method of arriving at errors of refraction. I would not depend upon my refractometer absolutely, neither would I depend upon skiascopy or upon the ophthalmometer. In fact, I would not solely depend upon any of these instruments for determining errors of refraction. At the same time, after using the refractometer in my office for several months, I have learned to like it, and should not like to do without it. I think it is a much more accurate method of estimating the axis of astigmatism than the one which is perhaps almost universally used, namely, the ophthalmometer. Perhaps I do not understand the working of the ophthalmometer as well as some of you do, but my findings by it, as to the axis of astigmatism in its degree, are quite inaccurate. Sometimes the test-lens and ophthalmometer vary many degrees, or even 90 degrees, possibly. I therefore feel that from my limited experience with the refractometer, that it is an instrument which is as valuable as any means we have at our command for estimating errors of refraction except, of course, the test-lenses under a mydriatic. I always regard this as a last resort. It is quite as necessary, however, to use a mydriatic in estimating errors of refraction with this instrument as with any other method.

DR. FRANCES DICKINSON (Chicago).—I have used the re-

fractometer but a few times and think there is a place for it. It is not to be relied upon as a last resort, in my judgment, unless we use a mydriatic. The method of skiascopy without a mydriatic leaves  $\frac{1}{4}$  or  $\frac{1}{2}$  D. uncorrected. So also will homatropine fail to give me full correction. I have not had the instrument long enough to make a comparison of its merits with the ophthalmometer. The latter gives us the degree of corneal astigmatism, while the refractometer is claimed to give us the intra-ocular as well as corneal, which is a desirable combination. It is even claimed that the refractometer gives us the entire amount of error, spherical as well as astigmatic. We know that the ophthalmometer gives us only the curvature error of the cornea, and that corneal astigmatism is the total astigmatism in 80 per cent. of the cases.

The age at which this instrument is of value in our work varies somewhat. In children and youth I have not obtained the same results with the refractometer that I get in old people or under a mydriatic. I regard the refractometer as an aid in my work, and I would not like to do without it. It seems, however, to influence the patient to use his accommodation, though intended to force complete relaxation by special construction. It has been a time-saver, in some cases. The test-lenses, a mydriatic, and the ophthalmoscope can always do the work completely and will probably never be displaced.

DR. A. E. PRINCE (Springfield, Ill.).—It is generally conceded that the test-lens in our work is the last court of appeal, and I make the appeal to begin with, of using the test lens. So far as I am concerned, there is no device that will do away with a reliable cycloplegic. If you get the axis of astigmatism by these devices you have to appeal to your test-lens before you are satisfied anyhow, and why not use the test-lens to begin with.

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Discussion of paper read by DR. DUDLEY S. REYNOLDS, of Louisville, Ky., entitled "*The Science of Ophthalmology*," which appeared in the June number of this journal.

DR. FRANCES DICKINSON (Chicago).—I wish to thank Dr. Reynolds personally for his very excellent paper. It coincides with my views entirely. In the last case reported by the Doctor, where the patient was away from him, and he instructed



her to put homatropine in her own eyes, how often was she to use it, and in what strength?

DR. C. D. WESCOTT (Chicago).—I am very much pleased with what Dr. Reynolds has said, and I quite agree with him. I hope he will tell us a little more in detail his method of conducting examinations under homatropine. Did you state the age of the patient?

DR. REYNOLDS.—Thirty.

DR. WESCOTT.—I would also like to ask the Doctor how many examinations he finds necessary before getting satisfactory results, and how he uses homatropine. My experience leads me to believe that it makes some differences as to how we use it in patients of 25 or 35 years of age. I use atropine wherever I can and my practice is to have the patient come day after day, using a one per cent. solution of sulphate of atropine two or three times a day until I get constant results. I have, however, to examine a good many patients under homatropine and be satisfied with one test. It seems impossible for many business men and students to give me more than a Saturday. Of course, I do this under a measure of protest. My best results have been in persons up to 45 or 50 years of age, where I have used the sulphate of atropine and making repeated examinations on different days. I am particularly anxious to have Dr. Reynolds tell us how he does those things that we are all doing. We want to know how best to do it.

DR. A. E. PRINCE (Springfield, Ill.).—What percentage of homatropine do you use?

DR. WESCOTT.—I use homatropine hydrobromate and cocaine hydrochlorate, 10 grains to the ounce, with 1 grain of salicylic acid to the ounce of sterile water. The patient introduces a drop of this solution in each eye every five minutes, and waits an hour from the first application, and in the next test I use the ophthalmoscope for examination of the fundus and determine the refraction with this as a guide. I use the Risley optometer in all my work. My homatropine cases I examine a second time on the next day if I can, but I frequently have to depend upon one test.

DR. J. E. COLBURN (Chicago).—Methods of examination I think must be largely personal. We have got to get at results in our own best way. A good deal depends upon the patient whom we have to examine and the conditions under which we

make that examination. These modify our action and the methods which we use. With young children atropine is the only thing that I feel any confidence in getting a result from, and two or three examinations extending over a period of four or five days are always necessary for a successful correction. With those who are trained to close observation, homatropine used much as Dr. Wescott has suggested gives me good results. But I am careful to examine not only once but two or three times on the same day. If I can get my patient to remain within control, I make two or three examinations under a mydriatic an hour or so apart. When I can not get them to give me two, three or four days for examination, then I always have them return for an examination on the second or third day, giving them the benefit of an after-examination when the pupil has contracted and the eye has resumed its functions. Then, if I find my patient will accept all of the correction, I give him all of it. If I find he will accept only a part of the correction, I give him that part with the understanding that he is to return again for further examination in case he has any annoyance. We must consider the personal equation in these cases. A dilated pupil does not give the accurate refraction that a contracted pupil does. Then, too, our results are going to be modified largely by the habits of patients, the position in which they hold their eyes in reading or writing, and their occupation. With the use of homatropine I am never certain that I am getting an accurate correction and I simply use it under a protest. In the use of atropine, if properly applied and long enough, I feel, after two or three examinations, that I get the whole refraction. I think errors of refraction require more time and care and consideration than are usually given them. We have to consider many things and be infinitely patient with all of our patients, and if a patient comes back to us with complaints, I do not think he is doing so for the fun of it. He may have ground for his complaint, and we should try to ascertain this. I have had some unpleasant results in my work, and I have found that I have not done my patients justice.

DR. PRINCE.—What strength of solution of homatropine do you use?

DR. COLBURN.—In young children I use 4 to 6 grains to the ounce. Of course, it depends largely upon the age of the

patient. In the case of an adult I would use it as Dr. Wescott has stated, in combination with cocaine.

DR PRINCE.—I want to say a few words on this subject, and I believe I have an element of truth in what I have to say. I have heard oculists condemn homatropine and say it is insufficient in that they do not get good results from its use. I have read a great many discussions on this subject by different men in different societies, and I have tried to analyze every single case, and have found that those who object to it do not use sufficiently strong solutions. I may safely say that for ten years I have invariably used a solution of homatropine in the proportion of 5 per cent., which is a stronger solution than is usually recommended, and I make it up in proportion of about 24 grains to the ounce, calling it 5 per cent. I add to it 2 per cent. of cocaine, not enough to disturb the epithelium, but enough to diminish the irritation of the homatropine. I use homatropine in the manner suggested by Dr. Colburn. It requires some judgment in using it in the case of children and adults, and at the ages of ten years or younger I use five drops at intervals of five minutes; at the age of 20 years I put in four at intervals of five minutes. When properly used I find I get the same results from it that I get from the use of sulphate of atropia. I have re-tested my patients with the use of sulphate of atropia, and my opinion is that I get just as good results from homatropine as from sulphate of atropia.

DR. FRANK ALLPORT (Chicago).—We all seem to have our own methods in treating these cases. I am a firm believer in the efficiency of homatropine in some cases—almost all cases. I have used homatropine for a good many years back and have rarely been disappointed in its use. I have used in years past 4 per cent. solutions of homatropine. I do not usually graduate the amount of medicine which I use with the age of the patient. Of course, after a patient has passed the age of 40, I am a little bit chary of using a mydriatic of any kind unless the exigencies of the case require it. When I first began the use of homatropine I used a 2 per cent. solution, but was not satisfied with it at that time. I then increased it to 3 per cent. and finally to a 4 per cent. solution, and for many years I have been quite satisfied with its use. I use a drop or two of it upon the cornea every five minutes for half an hour, making about six applications in forty-five minutes. After the last applica-

tion I consider my patient ready for examination. I think it makes a great deal of difference in using a homatropine solution, whether you drop it loosely upon the lower conjunctiva, as I have seen it done in many instances, or whether you have the patient throw the head back and pull up the upper lid and drop it upon the cornea itself. I think probably that has been the observation of most of you. In using a mydriatic for any purpose whatever we get a more powerful effect by dropping it upon the corneal tissue instead of upon the lower conjunctiva, as is done carelessly in many instances.

For the last two or three years I have been using the homatropine discs recommended, I believe by Dr. Wood, and prepared by Wyeth. I do not remember the exact strength. I presume these discs are familiar to you all, and so it is unnecessary to explain them. I get better results from the use of these discs than from solutions of homatropine. I use a disc in each eye and have the patient keep the eyes closed for twenty minutes, then I introduce another disc, and in forty five minutes from the introduction of the last disc my patient is ready for examination. When it comes to examining the patient under the influence of a mydriatic, we must be guided by the general deportment of the eye. If our examination with the ophthalmometer—upon which I do not place a great deal of reliance, and with the test-lens are harmonious—I feel that the case has been properly refracted. If there are any discrepancies, then I use the sulphate of atropia solution, or if the patient expresses doubt in the use of the different lenses from time to time, if they are not exact in their answers, if they can not tell you exactly what spherical or cylindrical lens they wish, if they are not accurate in their axis, I consider that my patient's accommodation is not properly paralyzed, and then I use sulphate of atropia. I must say that it is very rarely necessary in my practice. The large proportion of cases that I refract are, so far as I know, properly refracted with reasonably good results—as good as the average man gets, I think, with the use of these homatropine discs. I am satisfied with their use and with the results I have obtained with the occasional use of sulphate of atropia where the exigencies of the case seem to require it.

DR. W. F. COLEMAN (Chicago).—This question is a very important one, in fact more important than any subject we



have discussed or will discuss at this meeting, and inasmuch as four-fifths of our work pertains to errors of refraction, I will ask the privilege of saying a few words. I am decidedly of the opinion that homatropine is not sufficient to completely paralyze the accommodation in clinical cases. If you say, in a physiological subject, yes, and that position was taken by Oliver, who has done more work in mydriatics than any man I know of. It was said that homatropine completely paralyzed the accommodation. Oliver was criticized for the position he took in regard to homatropine, and he was good enough to write an explanation in answer to the criticism, in which he stated that he never relied upon homatropine in his clinical cases. I have no better authority than he. In discussing the subject before the Chicago Ophthalmological Society, I made the remark referred to, and I was surprised at the unanimity of opinion on the part of the members in favor of homatropine. I asked, what proof have you that homatropine completely paralyzes the accommodation? Not one could give proof except to say the results were satisfactory in correcting the error of refraction. We are perfectly astonished sometimes in hearing patients say with what glasses they have comfort. But the question is, do we paralyze the accommodation with homatropine? To satisfy myself on this point I made a series of experiments in one hundred cases about five years ago. I put patients under a solution of homatropine in the proportion of from 8 to 20 grains to the ounce, four times a day, and proceeded to examine them shortly thereafter. My results were practically these, that not in more than one eye in twenty did I get full paralysis with homatropine. The variation was as much as  $\frac{1}{4}$  D. in spherical error, and as much as  $\frac{1}{2}$  D. to  $1\frac{1}{2}$  or 2 D. in the cylinder. The axis was frequently different under homatropine. For my part, I have ceased to be interested in the subject or in discussions pertaining to it. How do we know after its use that a patient is properly refracted, and that the axis cylinder is correct?

I agree with the doctor who says that he does not rely upon the ophthalmometer. It is probably correct in 80 per cent. of the cases, but most of us rely upon the test-lens as a last resort.

DR. L. R. CULBERTSON (Zanesville, Ohio).—I have used homatropine in the strength of from 2 to 6 per cent. with oph-

thalmic discs, and in about one-half of my cases, in testing afterwards, I have found that the accommodation was not entirely relaxed. In recent years I have used the salicylate of atropine where the patient could spare the time to have atropinization. The salicylate has the decided advantage over the other salts of atropine in that it does not undergo changes with time.

DR. ALLPORT.—In order to defend what I said a moment ago, I wish to add a few words. I believe that I stated that of the various tests I consider the homatropine test was sufficient in most cases. I wish to remark parenthetically that my refraction cases are tested with the ophthalmoscope, the retinoscope, the ophthalmometer and with the test lenses, and if the results from these various methods are reasonably close, I consider the homatropine test is sufficient. There is no better method of estimating the axis of astigmatism than by using an over-strong lens, then grading it down to the cylinder which is necessary.

DR. COLBURN.—The strength of the solution I use has been made weaker and weaker, and the time of using it longer, because I find strong solutions are not so well borne. The absorption is not so perfect and the result in three hours is much better than the result from a strong solution in forty-five or fifty minutes.

DR. PRINCE.—Dr. Colburn speaks of using a weak solution and waiting three or four hours. As a matter of fact, by this time the first drop has lost its effect. I use a strong solution every five minutes, and make my examination at the end of from forty-five minutes to an hour after the last drop is in. In an hour or two from that the patients see much better, showing that the effect is beginning to pass off. It is important not to make the examination too long after the last drop is put in.

DR. A. ALT (St. Louis).—I want to say that I have done as Dr. Prince does, using homatropine solution in the proportion of from 6 to 10 per cent., but I have found it to be extremely irritating to many patients, producing nausea in some and fainting spells in others. In a large number of cases I did not succeed in getting the full cycloplegic effect. While efficient in some, we can never tell how it will act in a given case. I use it now only when I can not keep a patient under control for any length of time and can not use a stronger cycloplegic,

and always tell the patient that it may be insufficient. Yet the question arises, is it always necessary to have a full cycloplegic effect in order to give the patient proper glasses? I do not think so, as after all, the patient usually can not wear the full correction. I have become more and more accustomed to the habit of ordering my patients to come back to me after the effect of the cycloplegic has passed off and then prescribing the glasses which are most comfortable after having had the patient read in my office for 2 or 3 hours. They usually take a weaker glass, but after awhile they will be able to accept a stronger one. I think patients are much more satisfied when they become thus gradually accustomed to the wearing of their full correction than when they are at once given the full correction and have to worry for several months before they can comfortably wear their glasses.

DR. A. E. BULSON (Fort Wayne, Ind.).—I fully appreciate the position taken by Dr. Reynolds with regard to the use of homatropine. I have heard him discuss the subject on several occasions, and I know him to be a warm advocate of the administration of homatropine in the correction of errors of refraction. At the last meeting of this Association I took occasion to warmly commend the practice from the fact that I have employed this method for several years with apparently excellent results. During the past year, however, I have had occasion to go back on my former views. I have always used homatropin very thoroughly; but the discs manufactured under the formula of Dr. Casey A. Wood have been preferable, and I have used them every five to ten minutes, and instead of using four in an hour I have used from six to eight in an hour and a half. I supposed that I got complete suspension of accommodation or a cycloplegic effect, but during the past year, much to my surprise, several patients whom I had previously examined returned to me, and when I examined them under atropine I found that the effect of homatropine at the previous examination had not been all that I supposed it was. I have used homatropine in many hundreds of cases and I must confess that I was a staunch advocate of it for several years, but I do not believe that it is applicable in all cases, as I believe Dr. Reynolds maintains. I fully believe that in 75 per cent. of the cases it is sufficient, but that in the other 25 per cent. it will utterly fail in its purpose. I am very glad to hear

Dr. Alt say that he believes it is not always necessary to get the full cycloplegic effect in order to give a glass that is comfortable to the patient, or one that will answer all of the purposes of the patient. We too frequently prescribe glasses that are too strong for the patient and decidedly uncomfortable. I believe this is a very sad mistake in a large number of cases, and that the patient, instead of being benefited by the glasses, and instead of wearing them, will lay them aside on account of the discomfort in becoming accustomed to them. I was criticized very severely for a paper I presented at one time to the effect that I gave partial correction in cases of hypermetropia, and was accused of being half-hearted in my treatment; nevertheless, I believed this half-hearted treatment in some cases is far preferable to giving patients the full correction. I would, therefore, strongly condemn the practice of giving full correction when a patient admits that he is too uncomfortable with them.

DR. C. BARCK (St. Louis).—I must confess that the older I get the less frequently I use mydriatics. I would like to say a word in favor of a method which has not been mentioned to-day, namely, the direct method by means of the ophthalmoscope. In a large number of cases the accommodation relaxes entirely in the dark room under examination with the ophthalmoscope. This method is excellent if the examiner can relax his own accommodation and can rely upon his own relaxation. The younger members of the profession do not use this method as extensively as we do, simply because retinoscopy is easier to learn for the beginner. It would be a good thing if this method was practiced more. I never use mydriatics in patients above 40 years of age. I use them most frequently in children, and especially in those cases where there are indications of spasm of the muscle of accommodation. In the latter instances I prefer the direct use of atropia instead of homatropine.

I will not speak of the error which I hope has been given up entirely, namely, having in view the idea of making all persons, so to say, emmetropic. In young persons too strong convex glasses will be rejected, and it seems to me we must be guided by the age of patients, and in this connection I would refer you to the table of Hirschberg.

DR. DICKINSON.—Dr. Prince tells us that he has used homatropine for ten years, and has obtained excellent results.



I shall try the method he has described. In our large cities we have hundreds of opticians doing refractive work, which makes it probable that the oculists get a large proportion of cases that are not easily refracted without the use of some mydriatic. Whereas, if one's practice comes from the country, where the patients are not at desk work, not indoors all day, and not of a nervous temperament, and has not the competition of hundreds of opticians, I would not be surprised if he had a larger proportion of refractive cases that are well satisfied with manifest errors and satisfied with the correction that is obtained under homatropine.

DR. A. L. ADAMS (Jacksonville, Ill.).—I would like to know in what proportion of cases approximately the Doctor finds persistent spasm of accommodation after using homatropine, and how he knows the ciliary muscle is absolutely relaxed.

DR. B. E. FRYER (Kansas City, Mo.).—I do not believe in the majority of cases we can get complete paralysis of accommodation with homatropine, and I agree with what Dr. Colburn has stated regarding its use, because we can not get patients to wait long enough. Scopolamine is a satisfactory cycloplegic, and it does not dilate the pupil under its full effect so much as it acts on the ciliary muscle. We have a minimum, so to speak, of dilated pupil, and a maximum of cycloplegic effect.

One other point, I think is, important. In giving people glasses it is very essential to find out their muscular conditions and to make the lenses center. We may produce a distressing condition from improperly centering the lens.

DR. WESCOTT.—How do you use scopolamine?

DR. FRYER.—I use one-fifth of one per cent. dropped into the eye two or three times. Occasionally you may get a toxic effect in young people, but care should be taken that it is not used too strongly.

DR. DUDLEY REYNOLDS.—I deeply deplore the necessity of being too brief, and I fear that I shall not be able to reply fully to all of the questions that have been asked and the points that have been brought out. As to the first question, asked by Dr. Dickinson, as to how Mrs. T. used homatropine, and whether it was used in combination with cocaine or not, I have to say that I did not use it in combination. The solution used by Mrs. T. was 1 grain of hydrobromate of homatropine dis-

solved in 1 drachm of distilled water. Of this she was directed to have one drop fall directly upon the cornea every morning and every evening. She continued it the entire time between October, 1896, and April 30, 1897.

In reference to the method of using homatropine for its cycloplegic effect, I have been greatly interested in it, and have wondered at the various methods pursued. In October, 1897, I began a series of experiments, which were published either in the *Philadelphia Medical and Surgical Reporter* or *Philadelphia Medical Times* in a clinical lecture reported some time in January, 1880. I reached the conclusion, after an elaborate series of experiments, that the strength of homatropine solution best adapted to general purposes was 16 grains to the ounce of distilled water, and I used it in that strength for a number of years, but finally came to the conclusion that it was perhaps too strong, and so I reduced it to one-half that strength. I am now in the habit of using it in the proportion of 1 grain to the drachm, or 8 grains to the ounce. I mix no cocaine with the solution. I do not keep any of the solution on hand. I have it put up fresh when I am going to use it. The patient is brought into my office, and my clerk, who is skilled in this business, puts a drop of the solution in each eye, taking pains to raise the upper lid and let the drop fall upon the cornea at intervals of about one minute, until ten applications have been made. Then, at the end of forty-five or fifty minutes, and sometimes as much as sixty minutes elapses before I can get hold of the patient, I begin my test with the use of Risley's optometer which I esteem of great value, because it gives me fixed relations between the patient, the lens, and the test objects. I use an obscuring opaque disc for the purpose of covering one eye, insisting that the patient keep both eyes wide open. I have the patient read what he can with the uncovered eye. If he can read down to about the fourth line from the top, I conclude that about 1.50 D. of hypermetropia is present. If that does not correct the error of refraction, I ask him to read the last line of the card backwards; then I put Donders' opaque disc before his eyes. I place it vertically and ask the patient what he sees. If there is no discrepancy at all as he looks through the center of the slot, then I present a series of lenses, always preferring to begin with something higher than the patient will require, and

after having made an analysis of the refraction, by revolving the stenopæic disc, I am able at once to determine whether there is suspension of accommodation. If I find the patient can see apparently as well with one glass as another, I say to him, you are not ready, go back to the clerk and have her put the drops in your eyes three or four times more; then I wait thirty minutes, and test him. I think in about 90 per cent. of the cases as they come to us that homatropine, when used in the manner I have suggested, will answer the purpose. It can be used in too great strength, and the interval after the last application can be too much extended, or in testing you may approximate it. In persons whose accommodation is thoroughly paralyzed by the first series of application of drops, and in many other persons in whom it has to be repeated—in something like 10 per cent. of the cases under 30 years of age—it becomes necessary to prolong the use of the solution from day to day or substitute for homatropin sulphate of atropine, and I have scarcely determined in my own mind which is the better plan. Sulphate of atropine does not always succeed. It utterly failed in my own eyes. It develops irritation which prevents suspension of accommodation. Sulphate of atropine is not an universally acceptable cycloplegic. Homatropine used in the manner stated comes the nearest to fulfilling all requirements. I often find in persons above 60 years of age there is still considerable accommodative power. In my own eyes I had no manifestation of presbyopia, until within the past year I have been obliged to add a spherical plus lens to my cylinders, which are +3.25 D. axis 90° combined with 0.75 D. spherical.

Dr. Wescott says he uses sulphate of atropine in persons of from 45 to 50 years of age. I think by so doing he assumes great risk. I am afraid of it. I have had no experience with the use of salicylates in combination with either homatropine or sulphate of atropine. Solutions of homatropine prepared, say yesterday, are sometimes deficient in power for use to-day, consequently I have a solution made and use it within an hour after it is made.

I may say to you that I have never had constitutional manifestations from the use of hydrobromate of homatropine in children. In young ladies I have occasionally had serious nervous disturbances following its use, but the element of hys-

teria was too conspicuously apparent to justify the suspicion that the effect was due to the drug. I do not see how anyone can use successfully sulphate of atropine in the strength mentioned by one of the speakers. I have known 4 grains of sulphate of atropine to the ounce of distilled water produce toxic effects in a robust adult, not once, but many times. It flushes the face and quickens the respiratory movements. These symptoms pass off after awhile, and when the acute manifestations with disturbance of the cardiac and respiratory centers have passed away, then the cycloplegic effect is supposed to be present. I am sure it is less uniformly so than will be found to follow the use of homatropine in the manner I have stated. I base my opinion upon the results of a series of experimental observations painstakingly recorded. I have no occasion to make any change in the strength of my solution, or to follow the method of varying the strength of the solution, as between children and adults, excepting in persons above 40, in whom there is no strong hypermetropia. I direct the applications to be limited to half a dozen instead of ten, about a minute apart.

As to the use of the ophthalmoscope in determining errors of refraction, I take it for granted that very few gentlemen rely upon it.

It has been stated by Dr. Prince that he prefers a combination of cocaine with hydrobromate of homatropine. I would like to say that my experience with the use of cocaine is this, that it frequently gets into the fauces and produces discomfort and sometimes alarming symptoms and renders the cornea more or less opaque. It is, therefore, objectionable.

Dr. Colburn referred to the matter of adjustment of the lenses. Upon that point I lay great stress. The question of correct adjustment of the lenses is the first one to be considered. I have had great difficulty in past years in getting frames made with deep enough nasal curve on the one hand, or large enough at the base on the other hand, of the proper form to enable the patient to wear them in a fixed and constantly satisfactory position.

As to the use of scopolamine, I have had no experience and consequently have nothing to say regarding it.

With reference to the question of partial correction, I am opposed to it, excepting for those who have hypermetropia



and hypermetropic astigmatism. I require the patient to read with glasses which unite parallel rays of light, they may use any modification they please for distance, but for reading I insist upon full correction of all forms of hypermetropia. In hypermetropic astigmatism of more than 2.00 D. I find young persons are often unable to relax their accommodation for distance, then I direct — cylinders of half the amount of refraction of the correcting + lens, to be worn with axis at right angles, and the full correcting + lens for reading.

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Discussion on paper read by DR A. C. CORR, of Carlinville, Ill., entitled "*Choroiditis and Choroido-Retinitis in Young Persons*," (see page 202 of this number).

DR. J. E. COLBURN (Chicago).—The paper of Dr. Corr's is interesting to me, because I have found quite a number of cases corresponding in clinical history and appearance to the ones described by him. I know that other gentlemen present have been making similar observations, and I would like very much to have them give expression to their thoughts if they are willing to do so at this time.

DR. C. D. WESCOTT (Chicago).—I can only say that I have been much interested in this class of cases. I have seen quite a number of them, and agree thoroughly with what Dr. Corr has said, that many of them are not traceable in any way to syphilis. I have absolutely been discouraged in my search for the cause in some cases. In others, I have attributed it to the taxing of the eyes when the general condition of the body was not up to par. The line of treatment which he has pursued is something like my own. I have put the eyes absolutely at rest, or as near as I could, and have done everything which seemed indicated to improve the general tone and purity of the blood. Some of the cases are unquestionably relieved by the proper use of salicylates in connection with absolute rest of the eyes. I have promoted elimination in all instances, as much as possible, while trying to increase the general nutrition, and improve the condition of the patient. In some cases I have been obliged to interdict the use of the eyes for months, and even a year in one case, and my ultimate results have been very much like those reported by the Doctor—very gratifying. If I had known the exact nature of this paper, I should have brought notes of my cases.

[TO BE CONTINUED.]

OPHTHALMOLOGICAL SOCIETY OF THE UNITED  
KINGDOM.

CLINICAL EVENING.

H. H. SWANZY, FR.C.S.I., President, in the Chair.

THURSDAY, MAY 5, 1898.

*Chip of Steel in the Eye, With Skiagraph.*—MESSRS. ERNEST CLARKE and MACKENZIE DAVIDSON showed a case. The patient was struck by a chip of steel in the right eye in November, 1897. A scar could be seen in the cornea, and in the anterior and posterior portions of the lens capsule. The opacity in the lens had somewhat increased since, and vision was reduced from  $\frac{6}{12}$ , when first seen, to  $\frac{6}{24}$ . A skiagraph taken by Mr. Mackenzie Davidson showed that the piece of metal was lodged in the ciliary region at the lower part. On ophthalmoscopic examination a mass of exudation could be seen at this point. The skiagraphic exposure had now been reduced to 90 seconds, and in the case of a child to 1 minute.

*Ophthalmoplegia Externa With Impairment of the Orbicularis Oculi.*—DR. JAMES TAYLOR showed a case. Hughlings Jackson had first drawn attention to a case exhibiting weakness of the orbicularis in paralysis of the third nerve exemplifying Mendel's hypothesis that the ultimate nerve supply of the orbicularis was the the third nerve. Mention was made of the similar association between paralysis of the orbicularis oris and the hypoglossal nerve.

DR. BEEVOR said that he had shown a case at this Society a few years ago in which there was double ptosis and weakness of the orbicularis; it was probable that in most of the cases where the nucleus of the third nerve was involved the orbicularis was affected. Dr. Taylor's case was important, as other muscles which had a nerve supply originating in the bulb—those of the palate—were affected; he believed this to be rare.

MR. FLEMMING said that anatomists were now agreed on anatomical evidence that the orbicularis was supplied from the third nerve nucleus.

*Rudimentary Development of the Iris.*—DR. JOHN GRIFFITH showed two cases. The patients were brother and sister, in whom the iris was present only as a rudimentary band, which was absent in the lower outer part entirely; the choroid and ciliary body were normal. In one of the cases there were anterior polar cataracts, without sign of previous perforation of the cornea, and the lenses were slightly displaced upwards. In both patients there was defect of the enamel of the teeth, and there was a history of fits.

MR. SYDNEY STEPHENSON had shown at the Society two brothers with aniridia, in whom there was deficiency of the enamel of the teeth, known to dentists as hypoplasia.

*Conical Cornea Treated by Galvano-Cautery.*—MR. G. A. CRITCHETT showed a case. The improvement in vision had been in the right eye from  $\frac{6}{LX}$  to  $\frac{6}{IX}$ , and in the left from  $\frac{6}{LX}$  to  $\frac{6}{XXIV}$ . In the last series of cases, about 15 in number, he had tried not to perforate the cornea; he used the cautery wire at the lowest possible red heat, so that not much more than the epithelium was affected; the whole area intended to be affected was burnt with this, then at a slightly greater heat he burnt a smaller disc within this area; then at a higher temperature still he burnt the center at a point only. During the first burning the aqueous disappeared, and the iris came into contact with the cornea. He used a flat, medium-sized point except for the central and last burning, when he used a small one.

MR. HARTRIDGE asked the reason for using the different degrees of heat; he was in the habit of using one temperature only, and had never seen the aqueous disappear.

DR. CRITCHETT said he thought a better cicatrix was obtained by this method.

Remarks were made by MESSRS. DOYNE, GUNN, and GRIFFITH.

*Case of Retinitis Circinata.*—MR. FISCHER showed a case. The patient was a woman, aged 66 years, unconscious of anything wrong with her left eye. She was healthy, and had no ascertainable kidney disease. The right eye was quite normal; in the left there was well-marked retinitis circinata completely surrounding the yellow spot, which was degenerated.

MR. LAWFORD thought this case was not typical inasmuch

as there was little or no change at the yellow spot, and the band of exudation was distinctly raised.

MR. GUNN thought this one of the manifestations of old-standing œdema of the retina, and that it was similar in nature to the asterisk seen in renal retinitis.

MR. DOYNE thought that the exudation was decolorized blood.

MR. HARTRIDGE had shown a case at the Society some years ago; the exudation had since entirely disappeared.

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*Peculiar Condition of Lens.*—MR. MARCUS GUNN showed a child who had a cataract in the right eye which had been diagnosed in early life, but nothing had been done for it. The right iris was much lighter in color than the left; there was punctate deposit on the back of the cornea; the center of the pupil was like an ordinary opaque membrane, with holes in it through which the O. D. could be seen with + 20 D. The peripheral part of the lens appeared like a brown grey granular exudation raised above the level of the central capsule.

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*Specimens, Etc.*—MR. ROCKLIFFE showed (1) Two specimens of Cystic Retina; some of the cysts were between the inner and outer nuclear layers, and the others were difficult to locate owing to degeneration of the retina; (2) Specimens of Pseudo-Glioma.

Remarks were made by MR. DEVEREUX MARSHALL.

SURGEON-CAPTAIN HERBERT showed specimens of Epithelial Xerosis of Conjunctiva.

MR. DEVEREUX MARSHALL and MR. RIDLEY showed specimens of Persistent Hyaloid Artery With Atypical Development of the Vitreous.

DR. G. H. HOGG showed a case of Polycoria.